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PHIPPSIA ALGIDA IN THE UNITED STATES

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The Central Rocky Mountains of Colorado occupy a focal position in studies of post-Pleistocene plant geography because they provide a residual Pleistocene environment of considerable area suitable for the maintenance of a number of plants primarily arctic and subarctic in distribution. Close inspection of certain areas in the Colorado Rockies in recent years by various botanists, notably C. W. T. Penland, Walter Kiener, and R. C. Barneby, has demonstrated that there are several centers of concentration of arctic-alpine epibiotics in the Colorado flora where a remarkable number of extremely rare species occur widely disjunct from their nearest arctic stations. Among the most notable rarities are *Armeria maritima*, *Aulacomnium turgidum*, *Braya* sp., *Crepis nana*, *Cystopteris montana*, *Eutrema penlandii*, *Gymnomitrium corallioides*, *Luzula sudetica*, *Ranunculus gelidus*, *R. pygmaeus*, and *Rubus acaulis*. The principal centers of concentration are the region of Hoosier Pass, Gray's and Torrey's peaks, Mount Evans, the Rabbit-Ears range, the Elk Mountains of Gunnison County, and Pikes Peak.

Phippsia algida (Phipps) R. Br., a tiny grass, was one of the first of these arctic rarities to be found in Colorado. Harry N. Patterson collected it in 1875, somewhere in the Clear Creek District west of Denver. Unfortunately, the citations in the literature with respect to Patterson's collection are not in harmony: "summit of Gray's Peak" (Hitchcock, Man. Grasses of U. S.); "Chicago Lake, near Georgetown" (Rydberg, Flora of Colorado); "high mountain peaks of Colorado, and probably Wyoming" (Coulter & Nelson, Manual of Rocky Mountain

Botany). Patterson's specimens were distributed among eastern herbaria and possibly to herbaria in Europe, but not a single specimen found its way into a herbarium in the Rocky Mountain region. This was unfortunate, because it now appears that considerable time and energy expended in efforts to rediscover *Phippsia* might have been saved had there been a readily available sheet of the original collection in a local herbarium.

In view of the fact that *Phippsia* was never collected elsewhere in the United States, nor was even represented in herbaria of the region in which it was first collected, the species has aroused considerable interest among Rocky Mountain botanists during the past half-century.

When a species is found only once in an area despite constant botanizing by many people over a period of 75 years, questions naturally arise as to whether it might have become extinct, or whether the plant really was collected in the area in the first place. With alpine species, such questions are tantalizing but solutions are seldom forthcoming because of the vastness and high degree of inaccessibility of the terrain above timberline. A collector's itinerary may be traced in regions where there are well-marked communities, trails, or roads, but on the tundra it is hard to guess at the direction a former collector was most likely to have taken. Even if this were possible, one might easily pass within a few yards of a coveted species without seeing it.

Phippsia, I am convinced, is about the most elusive alpine fugitive that could be imagined. It is extremely small, it possesses no outward distinctiveness of its own, and it grows in a region where numbers of other species might be easily mistaken for it. *Phippsia* is what some botanists would call a "belly-plant," standing only a few centimeters high (1–2 cm. in our specimens), having rather glaucous green, soft, smooth leaf-blades with boat-shaped tips, as in *Poa*. In the vegetative state it might be passed over for a small *Poa*, such as *P. annua*. The inflorescence is a rather tight, short, inconspicuous panicle hardly exceeding the leaves. The spikelet is one-flowered, and the diagnostic features are the very unequal glumes which are much shorter than the floret. The first glume is sometimes lacking. Considering the minute size of the plant, its drab appearance, our lack of specimens readily available for comparison, the ab-

sence of precise locality, habitat, or phenological notes which might have served as guides, and the rugged, trackless nature of the terrain in the Georgetown area, it is easy to see why the search for *Phippsia* has been prolonged and unrewarding.

This article, however, is written not as an obituary to the wasted efforts of botanists who over the years have tried and failed. On the contrary, we now are able to report that the mission, at long last, has been successful and that the occurrence of *Phippsia* in the United States is verified. The circumstances of the discovery and the events leading up to it are recorded here in order to aid botanists in future searches elsewhere in the Rocky Mountains, and to bring into sharp focus the importance of careful recording and citation of collection data.

During the past six years I have been keenly interested in the *Phippsia* problem, and have sought *Phippsia* on all of my excursions above timberline. Following Hitchcock's citation, my efforts were concentrated upon the slopes of Gray's Peak, a 14,000-foot spire in east-central Colorado. The summit of Gray's Peak, if the citation is to be taken literally, is hardly a habitat for this grass, for above 13,500 feet the mountain is a barren, dry boulderfield offering hardly a foothold for anything, much less a semi-aquatic grass species such as *Phippsia* seems to be in its arctic habitat.

Unable to discover the grass in numerous trips to the Gray's Peak region, I naturally went to the literature in order to see if there might be any light forthcoming from the citations. Rydberg's Flora of Colorado happened to provide the key to the whole situation, although I didn't realize this at first. Rydberg's citation reads, "Chicago Lake, near Georgetown." It so happens that Chicago Lake is not on Gray's Peak nor even near it, but is a high alpine lake on the slopes of Mount Evans, about ten miles farther east.

This bit of information suggested that an examination of Patterson's original specimens might be in order, because the citations of Hitchcock and Rydberg were obviously contradictory. Dr. Julian Steyermark very kindly provided me with a facsimile label from the specimen in Field Museum. This is one of Patterson's characteristic printed labels, and reads in part as follows: "Colorado Flora—Mts. about the head waters of Clear

Creek—Alt. 11–14,000 feet. High mountains, Gray's Peak and vicinity. H. N. Patterson Sept. 2, 1885." This evidently, was the portion of the label which Hitchcock chose to cite in the Manual of Grasses. However, there is a slight addition to these data, written in Patterson's own hand, as follows: "wet places, alt. 1000 ft. above (s. of) Upper Chicago Lake." This was the portion of the label which Rydberg chose to cite in his Flora of Colorado. As is often the case with the older collections, the printed label contained rather general information and could be used for plants from any locality within a large general area, whereas any additional specific information was written in by hand. Here, apparently, was the specific information we needed. It seemed obvious that our efforts should be withdrawn from Gray's Peak and directed to the Chicago Lake Basin on the north-east slope of Mount Evans.

Hoping to duplicate as closely as possible the collecting date on which Patterson found *Phippsia*, Dr. T. P. Maslin, Dr. Sam Shushan and I drove to Mount Evans on September 4, 1951. We found that the excellent highway to the summit of Mount Evans skirts a high ridge directly east of the Chicago Lakes basin, and at Summit Lake it approaches a saddle from which the lakes may be seen from a point just about "*a thousand feet above (south of) the upper Chicago Lake.*" After descending a short way into the cirque, we were unable to locate any likely sites for *Phippsia*, and were almost ready to chalk up another wasted afternoon. We sat on the rocks along the shore of Summit Lake to eat our lunch and to meditate upon the futility of botanical exploration. After lunch we all felt better about the situation and decided to walk around Summit Lake for one last look. The rest is history. For *Phippsia* was waiting for us in the beds of the small inlet streams feeding Summit Lake. It is hard to describe our consternation. After all the arduous climbs up into inaccessible cirques and couloirs, risking life and limb in a futile search, we now found our plants in full view of the highway and practically on a level with it; in fact, within easy walking distance of the Summit Lake shelter house.

There were certain aspects of the plants and of their habitat that should be noted. These plants form loose tufts in the drying beds of small inlet streams feeding Summit Lake. It is my

opinion that the entire plant is probably submerged during most of the year, either covered by snow or by the nearly-freezing water of snow-runoff. When we found the species in early September, the inflorescences were just beginning to emerge from the "boot." Very often, only the distal portions of the leaf-blade are visible because of the sand which is constantly washed over the plants. *Phippsia* is the only vascular plant that grows right in the stream channels.

The extreme rarity of *Phippsia* in the region may be due to the scarcity of relatively level wet areas at the high altitudes at which it grows. High lakes with gently sloping boggy margins are not common. It is probable that at the Summit Lake locality there exists a complex array of climatic and edaphic conditions and seasonal rhythms which are rarely met with elsewhere and which are not easily detected by our present tools of ecological analysis.

It is also possible that future exploration may show that *Phippsia* is more common in the Colorado Rockies than is now assumed. I personally doubt this, but the fact remains that, by and large, the alpine regions of Colorado are still relatively unknown botanically. The discovery of any new areas of relict concentration may change the picture radically.—University of Colorado.

STUDIES IN THE GENUS EUPHRASIA L.—III[1]

E. O. Callen

Euphrasia arctica Lange

In a review of the origin and validity of the name *Euphrasia arctica*, Fernald (1933) pointed out that Linnaeus, and subsequently Willdenow, described *E. latifolia* from southern Europe and northern Africa, but that the plant now belongs to the genus *Parentucellia* as *P. latifolia* (L.) Caruel. In 1814 Pursh identified a Labrador plant (from the Dickson Herbarium) as *E. latifolia*, and for his Flora Americae Septentrionalis he copied Willdenow's description, but added this comment at the end:—"flowers smaller, pale purple." As a result, when identifying Canadian

[1] Previous papers in Journal of Botany **78** (933): 213–218, 1940; and vol. **79** (937): 11–13, 1941.